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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/249,463	02/12/1999	TETSUYA IIZUKA	P98.2690	9962

33448 7590 04/06/2004

ROBERT J. DEPKE LEWIS T. STEADMAN
HOLLAND & KNIGHT LLC
131 SOUTH DEARBORN
30TH FLOOR
CHICAGO, IL 60603

EXAMINER

TRAN, NHAN T

ART UNIT	PAPER NUMBER
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2615

18

DATE MAILED: 04/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/249,463

Applicant(s)

IIZUKA, TETSUYA

Examiner

Nhan T. Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1/29/2004</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/29/2004 has been entered.

Response to Arguments

2. Applicant's arguments filed 1/29/2004 have been fully considered but they are not persuasive.

The Applicant submits that the prior art of record does not teach or suggest the limitation of the mixed signal comprised of signal charges that are originally generated by pixel separated by at least one intervening pixel whose signal is not included in the mixed signal (page 5). In response, the Examiner respectfully disagrees with the Applicant. The amended claims still read on the prior art of record as set forth below:

Ishimagi shows, in Figs. 12A-12C and col. 14, line 34 – col. 15, line 15, that the mixed signal, more specifically mixed G signal, is comprised of signal charges that are originally generated by pixels separated by at least one intervening pixel (either R or B) in the row whose signal charge (R or B signal charge) is not included in the mixed signal of G. Therefore, the Examiner believes that the broadest interpretation of the present claimed invention does read on

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the cited references at least for the reasons discussed above and as stated in the following Office Action.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1 – 4, 6 - 9 are rejected under 35 U.S.C. 102(e) as being anticipated by Ishigami (US 6,198,507).

Regarding claim 1, Ishigami discloses a method of driving a solid-imaging device comprising the steps of:

mixing signal charges of pixels (e.g., mixing G signals) distant from each other in the horizontal direction transferred to a horizontal register from a vertical register within the horizontal register (see Figs. 12A-C; col. 14, line 20 - col. 15, line 15);

transferring the mixed signal charge in the horizontal direction, wherein the mixed signal is comprised of signal charges (G signal charges) that are originally generated by pixels separated by at least one intervening pixel (either R or B) in the row whose signal charge (R or B

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signal charge) is not included in the mixed signal of G (see Figs. 12A-C; col. 14, line 34 - col. 15, line 25).

Regarding claim 2, Ishigami also clearly discloses that after the signal charges of pixels distant from each other on said one row are separately transferred from the vertical register to the horizontal register (col. 14, lines 38-40), one signal charge is transferred to the horizontal register, said one signal charge is transferred within the horizontal register and the other signal charge is transferred to the horizontal register, in which the signal charges are mixed (see Figs. 12A-C and the Examiner's analysis in claim 1).

Regarding claim 3, when signal charges of pixels distant from each other said on one row are transferred from the vertical register to the horizontal register, the signal charges are transferred at every the vertical register (Figs. 12A-C).

Regarding claim 4, Ishigami further clearly shows that the pixel has a color filter thereon and pixels distant from each other on said one row are same in color (see Figs. 7 & 12; col. 14, lines 52-53).

Regarding claim 6, Ishigami discloses a camera comprising a solid-state imaging device which has a two-dimensional pixel array provided with a photo-electric conversion unit for photo-electric converting incident light to a signal charge and a vertical register for transferring the signal charge or a vertical register having a photo-electric conversion function for

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transferring a signal charge and a horizontal register for receiving and transferring the signal charge transferred by the vertical register (Figs. 5 and 12A-C), the camera operating in a first mode (interlaced mode – S_{IL}) in which signal charge of pixels distant from each other in the horizontal direction are transferred from the vertical register and to the horizontal register are mixed within the horizontal register, the mixed signal charge is transferred in a horizontal direction and output, such that the mixed signal is comprised of signal charges (G signal charges) that are originally generated by pixels separated by at least one intervening pixel (either R or B) in the row whose signal charge (R or B signal charge) is not included in the mixed signal of G (see Figs. 13, 14; col. 17, lines 28-50 and the Examiner's analysis in claim 1);

and the camera operating in a second mode (noninterlaced mode – S_{NIL}) in which the register charges are separately transferred in a horizontal direction as a signal charge of each pixel without being mixed within the horizontal register, the first and second modes being switchable (see Figs. 13, 14; col. 17, lines 6-26, wherein the noninterlaced signal presents the signal charge of each pixel without being mixed).

Regarding claim 7, see the Examiner's analysis in claim 2.

Regarding claim 8, see the Examiner's analysis in claim 3. Additionally, Ishigami shows that the signal charges are transferred at every vertical register of adjacent constant columns (Figs. 12A-C).

Regarding claim 9, see Examiner's analysis in claim 4.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 5 & 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishigami (US 6,198,507) in view of Takahashi et al (US 6,288,744).

Regarding claim 5, Ishigami discloses a solid-state imaging element (Figs. 5 & 12A-C) having a photo-electric conversion means (1) for photo-electric converting an incident light to a signal charge in a vertical direction and a horizontal register (4) for receiving and transferring the signal charge transferred by the vertical transferring means (2) in a horizontal direction, comprising a transfer gate unit (VH1, VH2) between the vertical transferring and horizontal register, and a transfer of electrode of a first (ϕ VH1) and a second phase (ϕ VH2) of the transfer gate unit, are disposed at every set of prescribed column(s) of the vertical transferring means wherein pixels corresponding to each set of prescribed column(s) of the vertical transferring means have the same color arrangement, such that the signal charges of pixels having common colors (i.e., G) **are mixed in the vertical direction**. See col. 11, lines 13-35 and the Examiner's analysis in claim 1. It should be noted that the mixed G signal is performed within horizontal

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register 4 but the signal charges are clearly mixed in the **vertical direction** where the upper G is mixed with the lower G as illustrated in Fig. 12C.

Ishigami does not explicitly disclose that the transfer electrode of a first and a second phase (shared shift registers) of transfer gate unit are disposed alternately at every set of prescribed column(s) of the vertical transferring means. However, Takahashi teaches an implementation of shared shift registers (133, 134) in solid-state imaging device to enable the information charges in channel regions of vertical registers on different columns to be made different from each other in a direction along the vertical shift registers (see Fig. 8; col. 11, lines 43-53).

Therefore it would have been obvious to one of ordinary skill in the art to modify Ishigami to include the teaching of the shared shift registers by Takahashi in the solid-state imaging device to enable the information charges in the channel regions of the vertical registers on different columns to be made different from each other in a direction along the vertical shift registers as an alternate configuration to reduce the number of transfer electrodes.

Regarding claim 10, see the Examiner's analysis in claim 5.

Conclusion

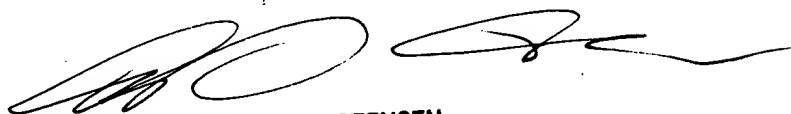
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nhan T. Tran whose telephone number is (703) 605-4246. The examiner can normally be reached on Monday - Thursday, 8:00am - 6:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew B Christensen can be reached on (703) 308-9644. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

NT.



ANDREW CHRISTENSEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600